

## **Multi-Purpose Cleaning Tool**

### Field of the Invention

The invention relates to cleaning tools with articulated heads and more particularly to a multi-purpose tool which is adapted to serve a number of purposes including window cleaning, wiping, painting, scraping, sanding and scrubbing.

### Background of the Invention

10 The applicant's Australian Provisional Specification No. 2003905909 is incorporated herein by reference.

A conventional window squeegee comprises a rigid tool that carries a straight, rubber blade. The tool is often incorporates a hollow handle. Because the handle is hollow and open ended, it can be used by grasping it or 15 by inserting an extension pole in the open end. Improvements and variations of the common window squeegee include the applicant's prior Australian Patent Application No. 2003900701 filed 18 February 2003 and PCT Application PCT/AU93/00287 (now issued as Australian Patent No. 668185). Devices of this type incorporate a rotating swivel located between the working 20 surface or edge of a tool and the handle. The present invention provides yet another alternative to prior art hand tools and particularly those hand tools that are used with extension poles.

In the present context and in the claims, surface tools or accessories are those like scouring pads, pads, painting pads, sponges, mops, sand paper tools 25 etc. that present a generally flat surface to work with. Edge tools and accessories refer here to a variety of blades that present a wiping or cutting or scraping edge etc. to work with.

Swivel in this specification and claims refers to a rotation and is used to distinguish the rotating motion of the flange and handle from the rotating 30 motion of the e.g head accessory and flange for which motion the term "pivot" is used.

## Objects and Summary of the Invention

It is an object of the invention to provide an alternative to prior art  
5 hand held or pole mounted tools, particularly tools for window cleaning,  
painting, scraping, scrubbing, sanding, floor mopping or the like.

It is also an object of the invention to provide a tool having rotating  
swivel with a concave underside between the handle the working portion of  
the tool.

10 It is also an object of the invention to provide a tool having both a  
rotating swivel and a pivoting hinge located between the handle the working  
portion of the tool.

It is also an object of the invention to provide a tool that is versatile and  
well suited for a number of different purposes.

15 Accordingly there is provided a handle having a nose portion. The nose  
portion has a contact surface that is inclined with respect to the long axis of  
the handle. The nose portion also includes a point of attachment for a flange.  
The flange and nose portion swivel or rotate with respect to one another. The  
flange also incorporates concave underside.

20 In preferred embodiments, the flange has a hinge portion that can  
receive a hinge pin or a variety of accessories.

In other preferred embodiments, a working head is provided. The  
working head includes a second hinged portion that cooperates with the first  
hinged portion. The first and second hinged portions form a hinge whose  
25 pivot axis is approximately 90° from the rotating swivel axis shared by the  
flange and pivot portion.

In particularly preferred embodiments, the working head is  
interchangeable with a variety of other accessories.

## 30 Brief Description of the Drawing Figures

Figure 1 is a perspective view of a multi-purpose cleaning tool  
according to the teachings of the present invention;

- Figures 2A & 2B are perspective views of the device depicted in Figure 1, illustrating the pivoting motion of the head;
- Figure 3 is an exploded perspective of one embodiment of the invention;
- 5 Figure 4 is an inverted perspective view of the flange depicted in Figure 3;
- Figure 5 is a side elevation, cross-sectioned to illustrate some of the features of the invention;
- 10 Figure 6 is an exploded perspective illustrating the handle and flange used without the head, the hinge portion of the flange accepting certain squeegee components;
- Figure 7 is a perspective view illustrating a handle and flange in conjunction with a squeegee blade;
- 15 Figure 8 is an exploded perspective illustrating the use of a handle and flange with a scraping or edge tool; and
- Figure 9 is a side elevation of the device depicted in Figure 8.

### Best Mode and Other Embodiments of the Invention

20 As shown in Figure 1, a multi-purpose cleaning tool 10 comprises a handle 11 that rotates or swivels 15 with respect to a flange 12. The flange 12 includes an integral hinge component 13. As will be explained, the basic elements of the multi-purpose cleaning tool 10 can be used in a variety of ways. In the example depicted in Figure 1, the tool 10 is used in conjunction with a pivoting head 14. As will be explained, the head 14 is removable and interchangeable with other tool components and itself serves a number of different functions.

30 The pivoting motion of the head 14 is depicted in Figures 2A & 2B. As suggested by 2A, the head 14 enjoys a pivoting connection with respect to the flange 12. By pivoting the head 14 in the direction of the arrow 20 in Figure 2A, the head can be placed into and temporarily maintained in the position depicted in Figure 2B where the rear edge 22 is facing forward. Thus, the head can be placed into two distinct working positions. In the position

depicted in Figure 2A, the underside 21 of the head 14 becomes the primary working surface and in this orientation, the tool 10 and head 14 may be used for jobs requiring a surface tool such as window washing, floor mopping, sanding, or painting etc depending upon the type of surface provided on the underside 21 of the head 14. In the orientation depicted in Figure 2B, the tool 10 and head 14 are better suited for utilising what is essentially the rear edge 22 of the head 14. This edge 22, when facing forward is useful in operations such as scraping or squeegeeing where the edge 22 rather than the face 21 is the primary working surface.

A more complete understanding of the device is had with reference to Figure 3. As shown in this example, the handle 11 is hollow and open ended. The handle 11 has a grip 30 and a nose portion 31. The nose portion 31 incorporates a chamfered or bevelled edge 32. This edge 32 is preferably shaped to make surface-to-surface contact with the dished or concave under surface of the flange 12. In this example, the surface 32 is inclined with respect to the long axis of the handle 11 by about 35°. The nose portion 31 also includes a point of attachment 33 that in this example is a through opening 34 that is formed into the nose portion 31 at approximately right angles to the contact surface 32. This opening 34 receives a pivot pin, stub axel or rivet 35 that also passes through a central opening 36 in the flange 12. As shown in Figure 4, the concave or dished underside 40 includes a feature such as a depression, notch or groove 41 that can be selectively engaged by a retaining clip 37 that is carried by a slot 38 formed in the handle 11. Thus by sliding the clamp 37 forward, the clamp's retaining finger 39 engages the recess 41 formed near the edge 42 of the flange 12 and prevents the handle 11 from pivoting around the pivot pin 35. When the clamp 37 is retracted, the head 11 is free to pivot. This arrangement is also depicted in Figure 5.

With reference again to Figure 3, the flange 12 is shown as further including a hinge portion 43 that is, in this example, wider then the flange. In this example, the hinge portion 43 is a channel having a "C" cross section. The bore 44 in the open ended channel 43 leads into a full-length longitudinal gap 45. The bore 44 receives a hinge pin such as a resilient hinge pin 46. The hinge pin protrudes from one or both open ends of the channel to engage a

head, tool piece or accessory as will be described. As shown in Figures 1 and 3, the resilient hinge pin 46 includes end pieces 47 that are biased apart by a central compression spring 48. Each end piece 47 may have a tab 49. The tabs 49 protrude through the gap 45. When compressed or brought together, 5 the tabs 49 retract the ends of the hinge pin so that the hinge pin disengages from the hinge components of a head 14, these components being the end caps 50. In this example, the end caps 50 have lower feet or flanges 51 that are retained in a longitudinal channel 52 formed in the head 14. Thus by bringing the tabs 49 together the flange 12 and its handle 11 can be disconnected from 10 the head 14. Once disconnected, the hinge pin 46 can be removed by sliding it out of one end of the channel. This allows the multi-purpose tool 10, including handle 11 and flange 12 and channel 43 to be used for a variety of other purposes.

Figure 3 also illustrates that the arrangement of flange 12, nose and 15 channel body 43 creates an inherent limit in the rotating motion of the handle 11. This occurs because the front surface of the nose 32 is in contact with the rear face of the flange. As shown in Figure 4, the handle cannot rotate or swivel any further once the lateral edge 32a of the nose contacts the channel 43. The rotating swivel action is thus limited in each direction of travel by the 20 bumper effect of the channel 43 on the nose of the handle. In preferred embodiments this limit to rotating swivel action results in a range of motion of 180 degrees or less. This is to be contrasted with so-called “universal” joint type tools that have considerably more than 180 degrees of motion and are therefore more difficult to control, being somewhat unwieldy when used as 25 hand tools.

As shown more clearly in Figure 4, the flange 12 is characterised, in preferred embodiments, by a concave or dished under surface 40. The under side surface 40 is generally radially symmetrical about the through opening 36. When connected to the nose portion's point of attachment 34, the 30 handle's flange contacting surface 32 and the flange's underside 40 make essentially surface-to-surface contact with one another which promotes the pivoting action of the handle with respect to the flange. Because the underside is dished, pivoting motion between the handle 11 and flange 12 is promoted or

facilitated with respect to embodiments of the invention in which the underside 40 and contact surface 32 are flat. As shown in Figure 4, the perimeter or edge of the flange 42 is preferably circular. By providing a relatively constant radius from the central opening 36 to the edge 42, the 5 operation of the clamp 37 and optimal contact with the surface 32 is obtained.

As shown in Figure 5, one example of a working head 14 comprises an extruded section into which various features are moulded. In this example, a central channel 52 is used to retain the hinge's end pieces 50. In this example, the working head 14 incorporates a rear edge 22 that is adapted to retain a 10 rubber squeegee blade 53. Thus, the rear edge 22 incorporates a rear facing "C" shaped longitudinal channel 54 that correctly positions the rubber blade 53. One or more longitudinal water removal grooves 55 are located beneath the rubber blade 53 and between the channel 54 and the extreme rear edge of the head 14. These grooves 55 allow water trapped beneath the blade 53 to be 15 released or discharged to prevent streaking on windows. The underside of the head 14, in this example, includes a pair of longitudinal recesses 56. These recesses 56 are located adjacent to the front and rear edges of the head 14 and are ideal locations for locating half of a hook and loop fastener system 56a (see Figure 3). The other half of the hook and loop fastener system is carried by 20 the pad, sponge, mop or other surface tool 58 (absorbent or not) that is available for attachment to the head 14. Note that the front edge of the head 14 includes a longitudinal bumper 58. When the head 14 is in the position depicted in Figure 2B, the bumper 58 creates the proper orientation of the rear edge 22.

25 It will also be observed in Figures 1, 3 and 5 that a forward facing surface on the flange's hinge portion 13 includes one or more raised mounds or portions 60. When the head 14 is urged into the position depicted in Figure 2B these raised portions 60 ride over the front sidewall of the central channel 52. This tends to keep the head 14 in the position depicted in Figure 2B until 30 it is urged by enough force that the interference between the protrusion 60 and the sidewall is overcome. The action between the protrusion 60 and the side wall causes both an audible and tactile feedback or "snap action" that works like a detent mechanism.

As shown in Figure 6, the multi-purpose tool 10 when disconnected from the head 14 can accept any number of other accessories. In this example, the central channel 44 of the flange's hinge component 43 can accept a rubber squeegee blade 61 with or without a rigid backing member 62.

5 As shown in Figure 7, with the use of a rigid backing member 62, the length of the squeegee blade 61 can exceed the length of the hinge component 43.

As shown in Figures 8 and 9, this same multi-purpose tool 10 can accept an edge tool such as an insert 80 that serves as a scraper. The insert 80  
10 includes a rigid backing 81 that conforms to the channel 44 and includes a portion 82 that protrudes from the gap 45. The insert 81 may include a permanent or removable scraper blade 83.

As described above, the multi-purpose tool of the present invention is versatile and easy to use. It can accept edge or surface tools and can both  
15 swivel and pivot simultaneously or independently, having detent type mechanisms on both the pivot axis and the pivot axis.

While the invention has been disclosed with reference to particular details of construction, these should be understood as having been provided by way of example and not as limitations to the scope and spirit of the  
20 invention as expressed in the claims.